U.S. Army Center for Health Promotion and Preventive Medicine

EPIDEMIOLOGICAL STUDY NO. 12-HF-01Q9e-06
COMPARISON OF PHYSICAL ACTIVITY AMONG
NEW UNITED STATES ARMY RECRUITS AND
HIGH SCHOOL STUDENTS
MARCH 2006

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U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE

The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) lineage can be traced back over 50 years to the Army Industrial Hygiene Laboratory. That organization was established at the beginning of World War II and was under the direct jurisdiction of The Army Surgeon General. It was originally located at the Johns Hopkins School of Hygiene and Public Health, with a staff of three and an annual budget not to exceed $3000. Its mission was to conduct occupational health surveys of Army operated industrial plants, arsenals, and depots. These surveys were aimed at identifying and eliminating occupational health hazards within the Department of Defense's (DOD) industrial production base and proved to be beneficial to the Nation's war effort.

Until 1995, it was nationally and internationally known as the U.S. Army Environmental Hygiene Agency or AEHA. Its mission is expanding to support the worldwide preventive medicine programs of the Army, DOD and other Federal Agencies through consultations/ supportive services; investigations and training.

Today, AEHA is redesignated the U.S. Army Center for Health Promotion and Preventive Medicine. Its mission for the future is to provide worldwide technical support for implementing preventive medicine, public health and health promotion/wellness services into all aspects of America's Army and the Army Community anticipating and rapidly responding to operational needs and adaptable to a changing work environment.

The professional disciplines represented at the Center include chemists, physicists, engineers, physicians, optometrists, audiologists, nurses, industrial hygienists, toxicologists, entomologists, and many other as well as sub-specialties within these professions.

The organization's quest has always been one of excellence and continuous quality improvement; and today its vision, to be the nationally recognized Center for Health Promotion and Preventive Medicine, is clearer than ever. To achieve that end, it holds ever fast to its values which are steeped in its rich heritage:

- *Integrity is the foundation*
- *Excellence is the standard*
- *Customer satisfaction is the focus*
- *Its people are the most valued resource*
- *Continuous quality improvement is its pathway*

The organization, which stands on the threshold of even greater challenges and responsibilities, has General Officer leadership. As it moves into the next century, new programs are being added related to health promotion/wellness, soldier fitness and disease surveillance. As always, its mission focus is centered upon the Army Imperatives so that we are trained and ready to enhance the Army's readiness for war and operations other than war.

It is an organization fiercely proud of its history, yet equally excited about the future. It is destined to continue its development as a world-class organization with expanded services to the Army, DOD, other Federal Agencies, the Nation and the World Community.

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14. ABSTRACT

New Regular Army recruits and high school students were compared on their level of physical activity. Both groups were asked "On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?" There were statistically significant differences in the distribution of responses between the new recruits and the general high school population for both men and women ($p<0.01$). On average, new recruit men and women reported 4.0±1.8 and 3.4±1.9 days/wk of activity, respectively, while high school men and women reported 3.8±2.2 and 2.9±2.2 days/wk of activity, respectively ($p=0.02$ for men, $p<0.01$ for women). The data suggests that new recruits tend to report more frequent physical activity than high school students.

15. SUBJECT TERMS

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EXECUTIVE SUMMARY
EPIDEMIOLOGICAL STUDY NO. 12-HF-01Q9e-06
COMPARISON OF PHYSICAL ACTIVITY AMONG NEW UNITED STATES ARMY RECRUITS AND HIGH SCHOOL STUDENTS
MARCH 2006

1. PURPOSE. This evaluation determined the physical activity of American youth and compared it to the physical activity of new recruits.

2. METHODS. To evaluate physical activities the following question was asked: "On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?" This question was asked on the New Recruit Survey (NRS) and on the Youth Risk Behavior Survey (YRBS). The NRS is a self-administered questionnaire mailed to a random sample of recently enlisted Regular Army recruits. YRBS is a self-administered questionnaire taken by high school students every 2 years in the spring. The responses of the two groups were compared.

3. CONCLUSIONS.

a. There were significant differences in the distribution of responses between the new recruits and the general high school population for both men and women ($p<0.01$). High school men and women were more likely to report no physical activity compared to recruit men and women. Recruit men and women were more likely to engage in 3-5 days of intense activity compared to the general high school population. Male new recruits reported an average±standard deviation of 4.0±1.8 days/week of activity while male high school students reported 3.8±2.2 ($p=0.02$). Male seniors, or 12^{th} graders reported 3.6±2.2 days/week of activity ($p<0.01$, compared to male recruits). Female new recruits reported 3.4±1.9 days/week of activity while female high school students reported 2.9±2.2 ($p<0.01$) and 12^{th} graders reported 2.4±2.2 days/week of activity ($p<0.01$, compared to female recruits).

b. The data suggest that individuals entering the Army participated in intense physical activity more frequently than high school students.

4. RECOMMENDATIONS. None.

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MARCH 2006

1. REFERENCES. Appendix A contains a list of references used in this report.

2. PURPOSE. This evaluation determined the physical activity of American youth and compared it to the physical activity of new recruits.

3. AUTHORITY. The Center for Accessions Research (CAR) requested that the Army Center for Health Promotion and Preventive Medicine (USACHPPM) examine physical activity in new recruits. The request was administered via a memorandum of agreement between the US Army Accessions Command and US Army Center for Health Promotion and Preventive Medicine and was signed on 29 July 2003.

4. BACKGROUND.

a. To fulfill this request, USACHPPM completed a number of technical reports on the current level of physical fitness of American youth and new recruits and on the feasibility of a pre-enlistment physical fitness test (references, 1, 2, 3, and 4). In this report, we compare the self-reported physical activity of new recruits to the self-reported physical activity of high school students. No previous reports were found in the literature on this topic.

b. New regular Army recruits and high school students were compared on their level of physical activity. Both groups were asked, "On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?" There were statistically significant differences in the distribution of responses between the new recruits and the general high school population for both men and women ($p<0.01$). On average, new recruit men and women reported 4.0±1.8 and 3.4±1.9 days/wk of activity, respectively, while high school men and women reported 3.8±2.2 and 2.9±2.2 days/wk of activity, respectively ($p=0.02$ for men, $p<0.01$ for women). The data suggest that new recruits tend to report more frequent physical activity than high school students.

5. METHODS.

a. We added a question about physical activity to the New Recruit Survey (NRS) and compared responses on that question to those of a similar question on the Youth Risk Behavior Survey (YRBS). The NRS is a self-administered survey, mailed to a random stratified sample of recently enlisted Regular Army recruits at their homes. For NRS, an analyst at the Center for Accessions Research (CAR) selects a sample of new recruits from the Recruit Quota System (REQUEST) database who are in the Delayed Entry Program (DEP). The DEP allows individuals to sign up for and delay entry into the services for up to one year (1). By mastering skills normally learned in Basic Combat Training, such as marching, saluting, and land navigation, recruits are able to gain rank before beginning BCT (reference 5).

b. The sample of new recruits for this study was selected like any other NRS sample. All available DEP members were stratified based on race/ethnicity, and gender. The stratified sample was sent to a contractor who bar-coded and mailed the survey. The surveys were returned to the CAR where personnel compiled the data.

c. The NRS has six sections. Five of these sections relate to interest in the military, concern for the future, motivation for enlisting, Army advertising, decision influences, current issues, and incentive programs. Section 6 is reserved for topical questions that can change throughout the year. We added a question (described below) to Section 6 of the 2003 survey that asked about physical activity. The CAR provided us with recruit responses to that question.

d. The YRBS is a self-administered questionnaire taken by high school students (grades 9 through 12) every 2 years in the spring. The questionnaire asks about six types of health risk behaviors including unintentional injuries and violence, tobacco use, alcohol and drug use, sexual behaviors, diet, and physical activity. The questionnaire has been administered since 1991 (reference 6). For this analysis, we used the 2001 YRBS data since this was the most recent information available. The YRBS data were downloaded from the Centers for Disease Control and Prevention (CDC) (reference 6). Other variables downloaded include age, sex, and grade in school.

e. The physical activity questions asked on the NRS and the YRBS were identical. The question was, "On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing or similar aerobic activities?" The six response categories on the NRS were: "a. 0 days, b. 1 day, c. 2 days, d. 3 days, e. 4 days, 5 days, g. 6 to7 days". The design of the NRS limited response categories to six. The YRBS has seven response categories, one for each day. The last two response categories on the YRBS were combined to make the data similar to the NRS.

f. Male and female data were considered separately. The distribution of responses on the NRS and YRBS was compared using the Chi-square test of proportions. Mean responses were compared using a two-sample Kolmogorov-Smirnov (K-S) Test.

6. FINDINGS AND DISCUSSIONS.

a. Of the 2790 responses received on the NRS, only data from the 1858 respondents that were 17 to 20 years of age were analyzed. The YRBS had 13,601 responses total, including 3290 from 12th graders. The 12th graders comprised 24 percent of the total YRBS sample, 11th graders 26 percent, 10th graders 25 percent, and 9th graders 26 percent. Table 1 shows the physical characteristics of the recruit and YRBS populations (missing values excluded). The recruit population was composed mainly of white males. The YRBS populations were predominantly white and approximately half male and half female.

Table 1. Physical Characteristics of (Physical Activity Question) Respondents

		New Recruit Survey Respondents		Youth Risk Behavior Survey Respondents		Youth Risk Behavior Survey Respondents 12th Graders	
Variable	Category	N	% Category	N	% Category	N	% Category
Gender	Male	1382	75.3	6320	48.7	1606	51.5
	Female	454	24.7	6654	51.3	1513	48.5
	Total	1836	100.0	12974	100.0	3119	100.0
Race	White	1225	66.7	6243	48.5	1543	50.0
	Black	260	14.2	2398	18.6	510	16.5
	Hispanic	243	13.2	3219	25.0	786	25.4
	Asian	69	3.8	374	2.9	111	3.6
	Hawaiian, Pacific Islander	16	0.9	79	0.6	19	0.6
	Native American	22	1.2	209	1.6	42	1.4
	Other	1	0.1	363	2.8	78	2.5
	Total	1836	100.0	12885	100.0	3089	100.0

b. Comparisons between the NRS and the YRBS are shown in Tables 2, 3, and 4. Table 2 shows that there were statistically significant differences in the distribution of responses between the new recruits and the general high school population for both men and women. A two-sample Kolmogorov-Smirnov Test (K-S test) was performed comparing men and women as well ($p<0.01$ for both measures). High school students were more likely than new recruits to report no days of physical activity. New recruit men and women were more likely to engage in 3 to5 days of intense activity compared to the general high school population. However, among men,

the percentages were higher in the YRBS group than in the NRS group for those who participated in 6 to7 days of intense activity.

Table 2. Comparison of New Recruit Survey and Youth Risk Behavior Survey (all grades)

Intense Activity (days)	Men				Women			
	NRS		YRBS 2001		NRS		YRBS 2001	
	N	%	N	%	N	%	N	%
0	87	6.3	809	12.8	49	10.8	1495	22.5
1	83	6.0	472	7.5	30	6.6	780	11.7
2	123	8.9	574	9.1	58	12.8	811	12.2
3	227	16.4	703	11.1	91	20.0	834	12.5
4	217	15.7	540	8.5	79	17.4	585	8.8
5	253	18.3	929	14.7	61	13.4	839	12.6
6-7	392	28.4	2293	36.3	86	18.9	1310	19.7
p-value[a]	<0.01				<0.01			
K-S[b] test	<0.01				<0.01			

[a]Chi-square statistic comparing NRS and YRBS
[b]K-S= Kolmogorov-Smirnov

c. Table 3 shows a comparison between the mean response categories on the NRS and the YRBS. Male new recruits were 1.05 times more active than male high school students (4.0/3.8); female new recruits were 1.17 times more active than female high school students (3.4/2.9).

Table 3. Comparison of Mean Response Categories on New Recruit Survey and Youth Risk Behavior Survey (all grades) (Values are means±SD days/week)

	NRS	YRBS 2001	p-value[a]
Men	4.0±1.8	3.8±2.2	0.02
Women	3.4±1.9	2.9±2.2	<0.01

[a]T-statistic comparing mean responses on NRS and YRBS

d. Table 4 compares NRS participants with 12th grade YRBS participants. Results were almost identical when comparing the new recruit and general high school populations. High school 12th grade students were more likely to report no days of activity than were new recruits. The percentages of male and female new recruits participating in 3 to 5 days of intense activity were higher than in the YRBS population. However, the percentage of the YRBS male population participating in 6 to7 days of activity was higher than in the NRS population. Table 5 compares the mean responses of NRS and YRBS respondents. Male new recruits were 1.11 times more active than male 12th graders; female new recruits were 1.42 times more active than female 12th graders.

Table 4. Comparison of New Recruit Survey and Youth Risk Behavior Survey (12th graders only)

Days of Intense Activity	Men				Women			
	NRS		YRBS 2001		NRS		YRBS 2001	
	N	%	N	%	N	%	N	%
0	87	6.3	241	15.0	49	10.8	463	30.6
1	83	6.0	144	9.0	30	6.6	221	14.6
2	123	8.9	168	10.5	58	12.8	163	10.8
3	227	16.4	196	12.2	91	20.0	189	12.5
4	217	15.7	134	8.3	79	17.4	113	7.5
5	253	18.3	215	13.4	61	13.4	150	9.9
6-7	392	28.4	508	31.6	86	18.9	214	14.1
p-value[a]	<0.01				<0.01			
K-S test	<0.01				<0.01			

[a]Chi-square statistic comparing NRS and YRBS

Table 5. Comparison of Mean Response Categories on New Recruit Survey and Youth Risk Behavior Survey (12th graders only) (Values are means±SD days/week)

	NRS	YRBS 2001	p-value[a]
Men	4.0±1.8	3.6±2.2	<0.01
Women	3.4±1.9	2.4±2.2	<0.01

[a]T-statistic comparing mean responses on NRS and YRBS

7. CONCLUSIONS.

a. Overall, men entering the regular Army reported that they participated in physical activity 5 percent more frequently than male high school students; women entering the regular Army reported that they participated in physical activity 15 percent more frequently than female high school students. These differences were even larger, 11 percent and 42 percent for men and women respectively, when new recruits were compared to 12th graders. Twelfth graders were analyzed separately because they were likely of closer age to the new recruits.

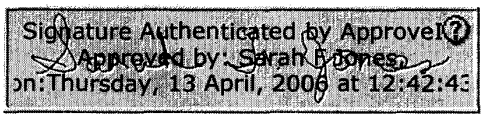
b. There were a slightly greater proportion of high school students indicating they participated in 6 to7 days of intense physical activity compared to the NRS respondents. This could be due to the fact that many of these high school students participated in sports teams at school and were physically active on the weekends. In addition, the last two response categories on the YRBS were combined to make the data similar to the NRS, which may have had some influence on the results.

c. We analyzed data from two different years (2003 for the NRS and 2001 for the YRBS). It would have been more useful to compare identical years' responses; therefore, our comparison of different years could have affected the results. However, the mean data for the last 2 years of the YRBS (1999 and 2001) was very similar suggesting the 2003 data might also be similar (reference 4). In addition, differences in the responses could also be explained by the fact that only 40 percent of all NRS respondents that year were asked the NRS question on physical activity because it was not asked during each sampling that year.

d. It would appear that physically active persons are more likely to enter the Army. Differences between new recruits and high school students were small, but differences between new recruits and 12th graders were larger, especially for women.

8. RECOMMENDATIONS. None.

9. POINTS OF CONTACT. Questions pertaining to this report should be referred to Ms. Sarah Jones, Injury Prevention Program, commercial (410) 436-3776, DSN 584-3776, or e-mail: sarah.jones3@us.army.mil.



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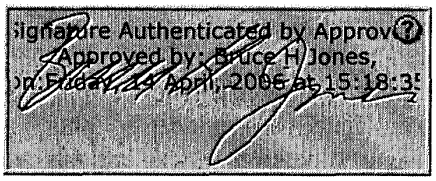

Dr. Bruce H. Jones
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APPENDIX A

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APPENDIX B

Acknowledgement

We would like to express our appreciation for the information provided to us by Ms. Claudia Tamplin on the New Recruit Survey.